I claim:

1. A method for controlling a fuel injection valve by means of a piezo-actuator, particularly for determining the injected fuel volume for pre- or post-injections, comprising the steps of:
- determining, from the current fed to the piezo-actuator for a main fuel injection and the voltage then building up at it, the temporal curve of the force exerted on the fuel injection valve,
- determining, from this temporal curve, the gradient of the tangent of the drop-off in force occurring after the force maximum,
- specifying a threshold value derived from these gradients of the tangent,
- determining, from the current fed to the piezo-actuator for a post-injection or pre-injection of a subsequent injection process following the main fuel injection and the subsequent voltage building up at it, the temporal curve of the force exerted by it on the fuel injection valve,
- determining, from this temporal curve, the gradient of the tangent of the drop-off in force occurring after the force maximum, and
- comparing the amount of this determined gradient with the threshold value, in which case it is assumed that a post- or pre-injection has taken place if the amount of the gradient exceeds the threshold value and it is assumed that a post- or pre-injection has not taken place if the amount of the gradient is less than the threshold value.

2. The method according to claim 1, wherein the temporal curve of the force exerted on the fuel injection valve for each fuel injection is determined by means of a non-linear actuator model.

3. The method according to claim 1, wherein alternatively to the temporal curve of the force exerted on the fuel injection valve, the temporal route curve or the speed of the piezo-actuator can be used as the comparison variable for a correct or incorrect injection process.

4. The method according to claim 1, wherein at specified time intervals or after a specified number of fuel injections, the current fed to the piezo-actuator for each pre- or post-injection adaptively becomes less by a specific, small amount in each case until the gradient jumps from the value allocated to a tangent to a clearly smaller value allocated to the tangent for which a fuel injection no longer takes place.

5. The method according to claim 4, wherein the threshold value is specified to be a value that lies between the amount values of the gradients of the tangent and the tangent.

6. A device for determining the injected fuel volume for pre- or post-injections, comprising:

- a fuel injection valve controlled by a piezo-actuator,
- a pulsator with a downstream end stage wherein control signals and signal parameters are fed to the pulsator from which it generates a signal shape for an output current of the end stage that is fed to the piezo-actuator,
- an analog/digital converter in which electrical signals that can be picked up at an input of the piezo-actuator are converted into digital signals,
- an arithmetic-logic unit in which the digital signals are processed for signal parameters for the pulsator, wherein the arithmetic-logic unit comprises a non-linear actuator model by means of which from the signals that can be picked up at the input of the piezo-actuator for each fuel injection, the temporal curve of force exerted on the fuel injection valve by the piezo-actuator, is determined and from the temporal curve the gradient of the drop-off in force after a force maximum is determined arithmetically and from the gradient a threshold value is derived,
- a storage unit in which the gradient of each main fuel injection and the derived threshold value are continuously stored, and
- a comparator in which the amount of the gradient determined for each pre- or post-injection is compared with the threshold value stored in the storage unit, wherein a parameter correction is integrated in the comparator that corrects the signal parameters that can be fed to the pulsator according to the result of the comparison.

7. The device according to claim 6, wherein the end stage is a current amplifier for the high-impedance control of the piezo-actuator.

8. The device according to claim 6, wherein the gradient allocated to a tangent is determined in the arithmetic-logic unit.

9. A device for determining the injected fuel volume for pre- or post-injections, comprising:

- a fuel injection valve controlled by a piezo-actuator,
- a pulsator receiving control signals and signal parameters from which it generates a signal shape for an output current that is fed to the piezo-actuator,
- an analog/digital converter coupled with an input of the piezo-actuator,
- an arithmetic-logic unit coupled with said analog/digital converter and said pulsator, wherein the arithmetic-logic unit comprises a non-linear actuator model by means of which the temporal curve of force exerted on the fuel injection valve is determined from which the gradient of the drop-off in force after a force maximum is determined from which a threshold value is derived,
- a storage unit in which the gradient of each main fuel injection and the derived threshold value are continuously stored, and
- a comparator receiving the gradient determined for each pre- or post-injection and the threshold value stored in the storage unit for comparison, wherein a parameter correction is integrated in the comparator that corrects the signal parameters according to the result of the comparison.

10. The device according to claim 6, wherein the pulsator comprises an end stage.

11. The device according to claim 10, wherein the end stage is a current amplifier for the high-impedance control of the piezo-actuator.

12. The device according to claim 6, wherein the gradient allocated to a tangent is determined in the arithmetic-logic unit.